

An illustration on the left side of the cover shows a birdhouse with a gabled roof and three circular openings, mounted on a tall wooden post. A small bird is shown in flight above the birdhouse. To the right of the birdhouse, there is a drawing of a kite with a diamond-shaped frame and a cross inside, with a long tail. The entire scene is framed by a decorative border.

# How to Build Bird Houses and Kites

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# BIRD HOUSES AND KITES

ILLUSTRATED

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## INTRODUCTORY

The purpose of this book is to give to boys and girls who live in the country, where most of the birds make their homes, some definite information about building these birds a house, that is easy to make, and suitable for birds to live in.

In most localities the birds come back in the spring, and are unable to find a suitable nesting place due to the fact that much of the timber and brush have been cleared away to make room for a greater cultivation of the soil.

The native birds are not so plentiful as they used to be due to the above facts and unless some artificial means is provided the farmer is going to lose one of his best friends and assistants.

It is the author's hope that this little book will inspire some boy to try his skill at bird house building, regardless of the scarcity of tools, and lumber. After you have built one house try and build several others, you can't put up too many, and the birds will surely appreciate them. Every farm yard ought to be full of bird houses, and at least two feeding shelters should be provided, where the birds can be fed on cold early spring mornings, and in the winter. Many of the birds will stay with you the year around if they are given food, and a protected house in which to live.

Birds are the only sure means of keeping down the steadily increasing growth of insect life that destroy crops and orchards. We must begin to realize that *no birds mean no crops*.

Bird houses must be built to suit each particular kind of bird and should have dimensions to correspond with the original nests these birds are in the habit of building where no houses are provided. The table printed here is the same as the one published by the U. S. Department of Agriculture and should be followed when building a house for each of the different birds.

Your bird houses can be as elaborate or as plain as you wish to make them. This book contains a few houses which are easy to make, serviceable, and according to government measurements.

Beginners should not attempt to build a large or fancy house. Try to make one of the small houses first and follow directions carefully.

### DIMENSIONS OF NESTING BOXES FOR VARIOUS SPECIES OF BIRDS

| Species                     | Floor of cavity | Depth of cavity | Entrance above floor | Diameter of entrance | Height above ground |
|-----------------------------|-----------------|-----------------|----------------------|----------------------|---------------------|
| Bluebird.....               | 5 by 5          | 8               | 6                    | 1½                   | 5 to 10             |
| Robin.....                  | 6 by 8          | 8               | *                    | 1                    | 6 to 15             |
| Chickadee.....              | 4 by 4          | 8 to 10         | 8                    | 1½                   | 6 to 15             |
| Tufted titmouse.....        | 4 by 4          | 8 to 10         | 8                    | 1¼                   | 6 to 15             |
| White-breasted nuthatch ... | 4 by 4          | 8 to 10         | 8                    | 1¼                   | 12 to 20            |
| House wren.....             | 4 by 4          | 6 to 8          | 1 to 6               | 1½                   | 6 to 10             |
| Bewick wren.....            | 4 by 4          | 6 to 8          | 1 to 6               | 5                    | 6 to 10             |
| Carolina wren.....          | 4 by 4          | 6 to 8          | 1 to 6               | 1½                   | 6 to 10             |
| Dipper.....                 | 6 by 6          | 6               | 1                    | 3                    | 1 to 3              |
| Violet-green swallow.....   | 5 by 5          | 6               | 1 to 6               | 1½                   | 10 to 15            |
| Tree swallow.....           | 5 by 5          | 6               | 1 to 6               | 1½                   | 10 to 15            |
| Barn swallow.....           | 6 by 6          | 6               | *                    | *                    | 8 to 12             |
| Martin.....                 | 6 by 6          | 6               | 1                    | 2½                   | 15 to 20            |
| Song sparrow.....           | 6 by 6          | 6               |                      | †                    | 1 to 3              |
| House finch.....            | 6 by 6          | 6               | 4                    | 2                    | 8 to 12             |
| Phoebe.....                 | 6 by 6          | 6               | *                    | *                    | 8 to 12             |
| Crested flycatcher.....     | 6 by 6          | 8 to 10         | 8                    | 2                    | 8 to 20             |
| Flicker.....                | 7 by 7          | 16 to 18        | 16                   | 2½                   | 6 to 20             |
| Red-headed woodpecker..     | 6 by 6          | 12 to 15        | 12                   | 2                    | 12 to 20            |
| Golden-fronted woodpecker.. | 6 by 6          | 12 to 15        | 12                   | 2                    | 12 to 20            |
| Hairy woodpecker.....       | 6 by 6          | 12 to 15        | 12                   | 1½                   | 12 to 20            |
| Downy woodpecker.....       | 4 by 4          | 8 to 10         | 8                    | 1¼                   | 6 to 20             |
| Screech owl.....            | 8 by 8          | 12 to 15        | 12                   | 3                    | 10 to 30            |
| Sparrow hawk.....           | 8 by 8          | 12 to 15        | 12                   | 3                    | 10 to 30            |
| Saw-whet owl.....           | 6 by 6          | 10 to 12        | 10                   | 2½                   | 12 to 20            |
| Barn owl.....               | 10 by 18        | 15 to 18        | 4                    | 6                    | 12 to 18            |
| Wood duck.....              | 10 by 18        | 10 to 15        | 3                    | 6                    | 4 to 20             |

\*One or more sides open.

†All sides open.

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Do not put up a bird house on a tree or barn facing the north. Birds as a rule will not use a house that faces in this direction.

Before starting to build a bird house it is necessary for beginners to know a few of the fundamental operations in wood work, what tools to use, and how to use them. Always try to have what tools you do use sharp and in good condition.

A good plan to follow in starting on the bird house is:

1. Cut the lumber to a rough size.
2. Square up the lumber to a finished size.
3. Lay out and mark off the correct sizes and shapes of the different pieces on the finished lumber.
- 4 Cut out the different pieces by following carefully the lines on the finished lumber with the saw and plane.
5. Fitting and assembling the different parts. This must be carefully done and all joints must be tight. A bird house that is not dry inside, well ventilated and weather proof is not liable to be occupied by any of our feathered friends.

The first house in this book is a simple little wren house that any boy ought to be able to make with a few tools, by following the directions carefully.

Do not be discouraged if you do not have any regular lumber. Get a box that is made of any soft wood, one-half inch thick. Take it apart carefully and you will have material that will do for the construction of any of these houses.

Before starting to cut any lumber study the drawings carefully and try to keep in mind the following points:

First—How the house ought to look when finished.

Second—The correct shape and size of each piece.

Third—How to make each part.

Fourth—How to assemble the different parts.

Fifth—Don't forget, tight joints, good ventilation, and plenty of room are three of the most necessary things that go together to make a house that is attractive to the birds.

When reading the finished dimensions on the lumber bill, thickness always comes first, then width, then length. Always go over your measurements before starting to cut the material.

The drawings in this bird house book are all designed and simplified,

so that any boy with a limited amount of material and tools who is a lover of birds, may be able to construct any of the houses by following the drawings and directions carefully.

To cover the houses with bark, put the house together first, then nail the bark on with small brads. Be sure there are no nails sticking thru on the inside of the house. Always cover the roofs with roofing so they won't leak.

## DIRECTIONS

**Cutting Stock.** Cutting stock means getting the different pieces ready to make the house. Always cut out the large pieces first and allow the different pieces to be one inch longer and one inch wider than the finished size, so you will be able to plane or saw them to the finished size and shape.

**Squaring Stock.** Squaring stock means to reduce a piece of rough lumber to one having flat, smooth sides, straight edges and square ends.

Squared-up stock is called finished stock. Finished stock is a piece of lumber that has been worked out to any given thickness, width and length.

**Laying Out Work.** To lay out work means to mark out the shape and sizes of the different parts on the finished stock. Always lay out the work on the best side of the finished stock and from the best edge.

**Cutting to Lines.** Cutting to the lines or layout means to remove the stock outside of the lines, thus making the piece the correct size and shape.

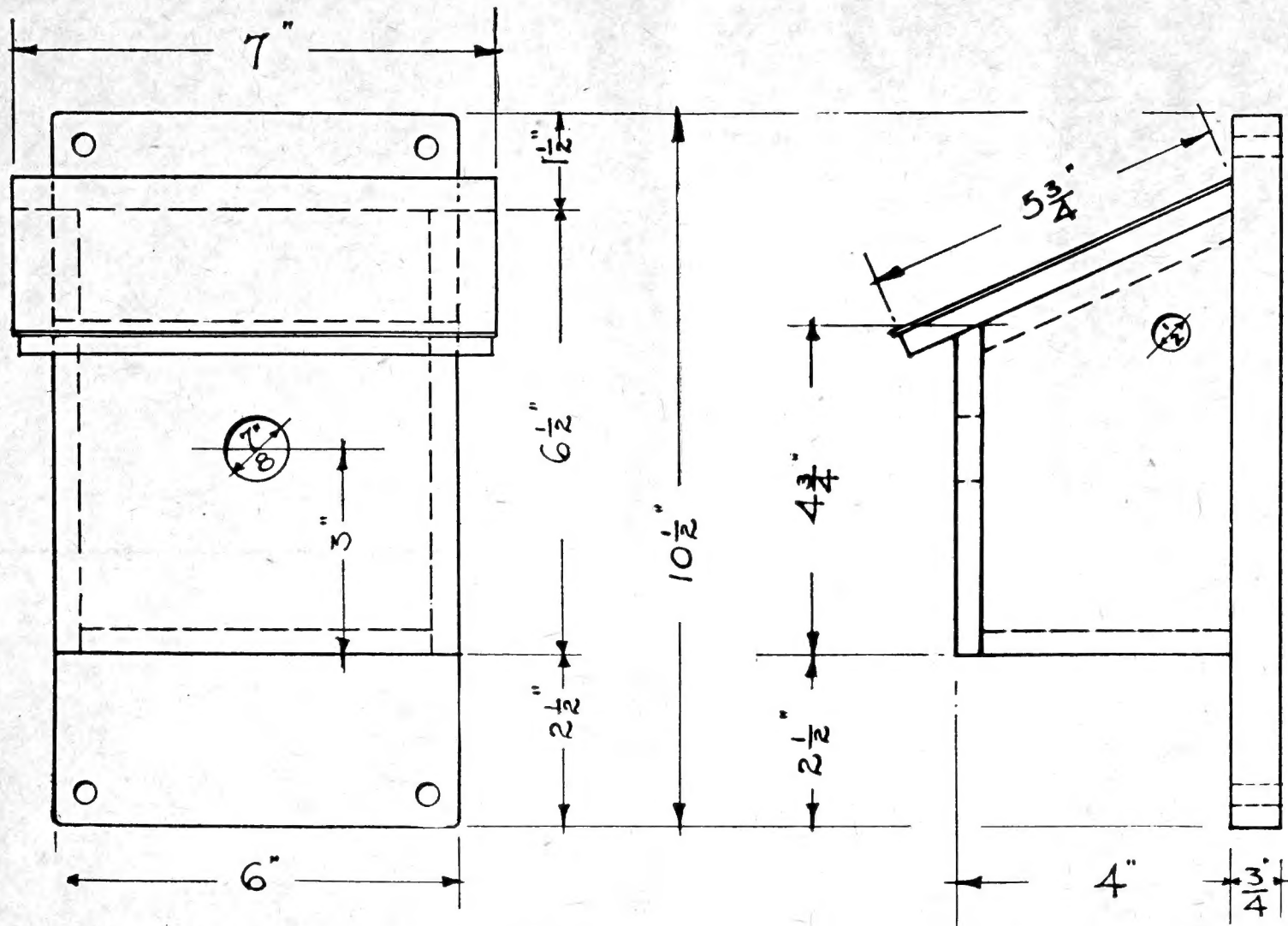
**Assembling.** Assembling means fastening the different pieces together. The most common way to put these houses together is with nails. Screws can be used if convenient. The place where two pieces come together is called a joint. A joint must always be tight and square.

In order to keep the cats out of the trees containing bird houses, take a piece of sheet iron about two feet wide and long enough to go around the tree and fasten it to the tree trunk about six or eight feet above the ground with a few small nails. If you have no sheet iron, get a joint of old stovepipe, which will answer the purpose just as well.

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*Herbert Hoover said: "I hope the people of the United States will be made to realize how closely related to this whole question of food-saving is the protection and encouragement of insectivorous and migratory birds."*





• WREN HOUSE.

# WREN HOUSE

## Material Required

Lumber—White pine or cypress.

| Pieces | Finished Sizes                                      | Use     |
|--------|---|---------|
| 1      | $\frac{3}{4}$ "x6" x10 $\frac{1}{2}$ "              | Back    |
| 2      | $\frac{3}{8}$ "x3 $\frac{5}{8}$ "x6 $\frac{1}{2}$ " | Sides   |
| 1      | $\frac{3}{8}$ "x4 $\frac{3}{4}$ "x6"                | Front   |
| 1      | $\frac{3}{8}$ "x5 $\frac{3}{4}$ "x7"                | Roof    |
| 1      | $\frac{3}{8}$ "x3 $\frac{5}{8}$ "x5 $\frac{1}{4}$ " | Bottom  |
| 1      | 5 $\frac{3}{4}$ "x7"                                | Roofing |

1 $\frac{1}{4}$  inch brads or shingle nails.

Tools—Rule, pencil, try-square, saw, plane, marking gauge, brace,  $\frac{7}{8}$  inch and  $\frac{1}{2}$  inch auger bits, hammer, and screwdriver.

## Construction

Cut out each piece rough and plane both sides smooth, plane both edges straight and both ends square.

After cutting out and squaring the stock to the finished sizes, mark each piece as shown in the drawing—saw and plane each piece to the correct shape.

The entrance hole in the front must be  $\frac{7}{8}$  inch in diameter, which is the correct size for a wren. If made larger the sparrows can get in and destroy the wren family.

Don't forget the one-half inch ventilation hole in the top part of the front piece and sides.

## Assembling

1. Nail sides to back of house one inch below the top end of the back and even with the outside edge; nails should be driven thru the back of the house into the sides.

2. Fit the bottom of the house between the sides and nail into place, keeping it even with the bottom ends of the two sides.

3. It is better to bore the entrance and ventilation holes before nailing the front to the house. Be sure and have the bottom edge even with the bottom of house and both ends even with the outside edge of the sides.

4. Now carefully fit on the roof. The roof must be left loose, so the house can be cleaned. It can be made removable, either by hinges at the top edge or fastened on with a few one inch screws.

## Finishing

The house is now ready for staining or painting and when finished should be nailed on a tree, post, or on the side of the house or barn about ten feet from the ground. If the house is fastened to a tree or post, a guard of some kind should be rigged up about two feet beneath the house, so the birds will not be disturbed by the cats.

If the house is covered with bark from birch tree and the roof covered with rubberoid or any manufactured roofing it is liable to be more attractive to the birds than a freshly painted house. Birds will not use a house that has an odor of fresh paint about it. Never paint or stain the inside of the house if you expect to get a tenant this year.

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*The U. S. Department of Agriculture at Washington, D. C., has issued several bulletins on bird life under the following numbers:*

*Circulars No. 56, 61; Farmers Bulletins No. 54, 456, 497; Bulletins No. 9, 15, 21, 23, 24; and Bulletins entitled "How Birds Affect the Orchard" and "Birds as Weed Destroyers."*

*The National Association of Audubon Societies, 141 Broadway, New York, N. Y., has issued several leaflets under the following numbers, which tell about birds, their habits, feeding, etc.*

*Leaflets Nos. 1 to 30, both inclusive; Special Leaflets Nos. 6, 14, 18, and a Bulletin entitled "The Audubon Societies in Relation to the Farmer."*

*Several of the Agricultural Colleges of the various states have issued similar bulletins, such as —*

*Bulletin No. 130 by the Kentucky Experimental Station, Lexington, Ky. Cornell Rural School Leaflet, Vol. 6, No. 2, Ithaca, N. Y. Bulletin No. 250 by the Ohio Agricultural Experiment Station, Wooster, Ohio.*



# WREN HOUSE

Here is a home for Mr. and Mrs. Wren that is artistic, and will not fail to attract these birds, if carefully made, and well placed. The roof may be curved, or straight, simply by changing the shape of the top-ends of the back and front pieces of the house.

## Material Required

Lumber  $\frac{3}{8}$ " white pine or cypress.

| Pieces | Finished Sizes                                      | Use    |
|--------|---|--------|
| 1      | $\frac{5}{8}$ "x $4\frac{5}{8}$ "x8"                | Back   |
| 2      | $\frac{3}{8}$ "x $5\frac{1}{4}$ "x $4\frac{5}{8}$ " | Sides  |
| 1      | $\frac{3}{8}$ "x $4\frac{5}{8}$ "x $5\frac{3}{4}$ " | Front  |
| 1      | $\frac{3}{8}$ "x $3\frac{1}{4}$ "x $3\frac{3}{4}$ " | Bottom |
| 2      | $\frac{3}{8}$ "x $3\frac{1}{2}$ "x $5\frac{7}{8}$ " | Roof   |

## Hardware, Etc.

One inch brads.

One inch screws.

Tools—Rule, pencil, square, saw, plane, brush,  $\frac{7}{8}$  inch and  $\frac{1}{2}$  inch auger bits, hammer, and screwdriver.

## Construction

Cut out each piece rough and plane both sides smooth, plane both edges straight, and both ends square.

After cutting out, and squaring the stock to the finished sizes, mark each piece as shown in the drawing—saw, and plane each piece to the correct shape.

The entrance hole in the front must be  $\frac{7}{8}$  inch in diameter, which is the correct size for a wren. If made larger the sparrows can get in and destroy the wren family.

Always bore the entrance and ventilation holes before putting the house together, and keep the ventilation holes well up under the eaves so draughts of air will not strike the young birds.

The curve on the top of the front and back pieces for the roof to fit on, must be exactly alike.

The two roof boards can be curved by soaking them in hot water for a few minutes, or hold them over the steam from a teakettle. They must be fastened on the house with screws in order to hold them down securely.

## Assembling

1. Nail the sides on the edges of the back piece two inches up from the bottom end. Nail the front between the sides keeping the bottom ends, and sides exactly even.

Always be sure the joints are tight before fastening these houses together. The back of this house is made longer than the front, and sides to allow for a means of fastening the house to a post or tree.

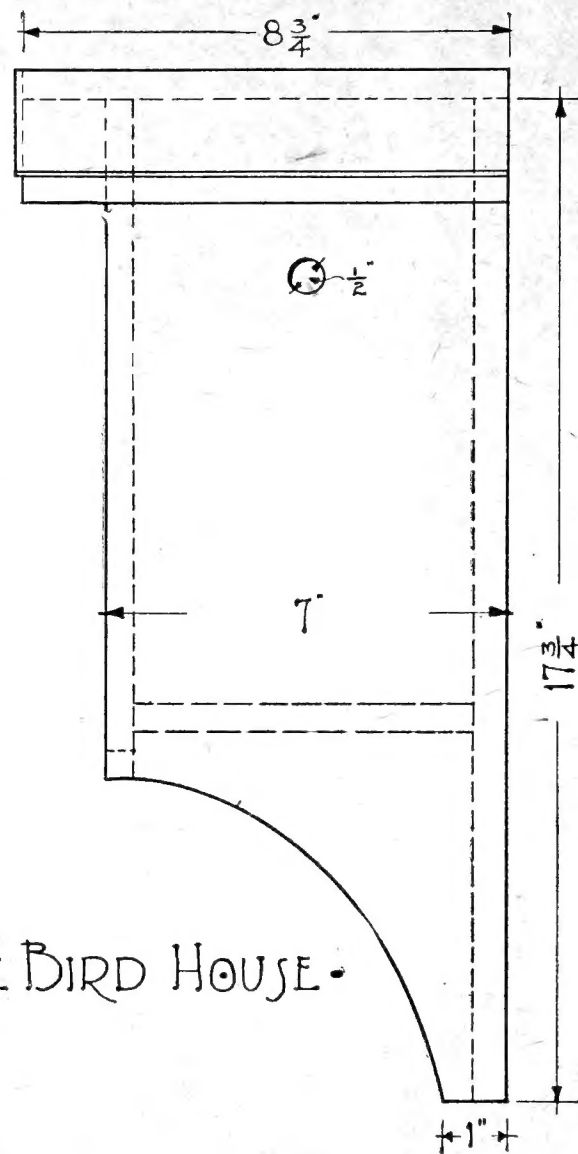
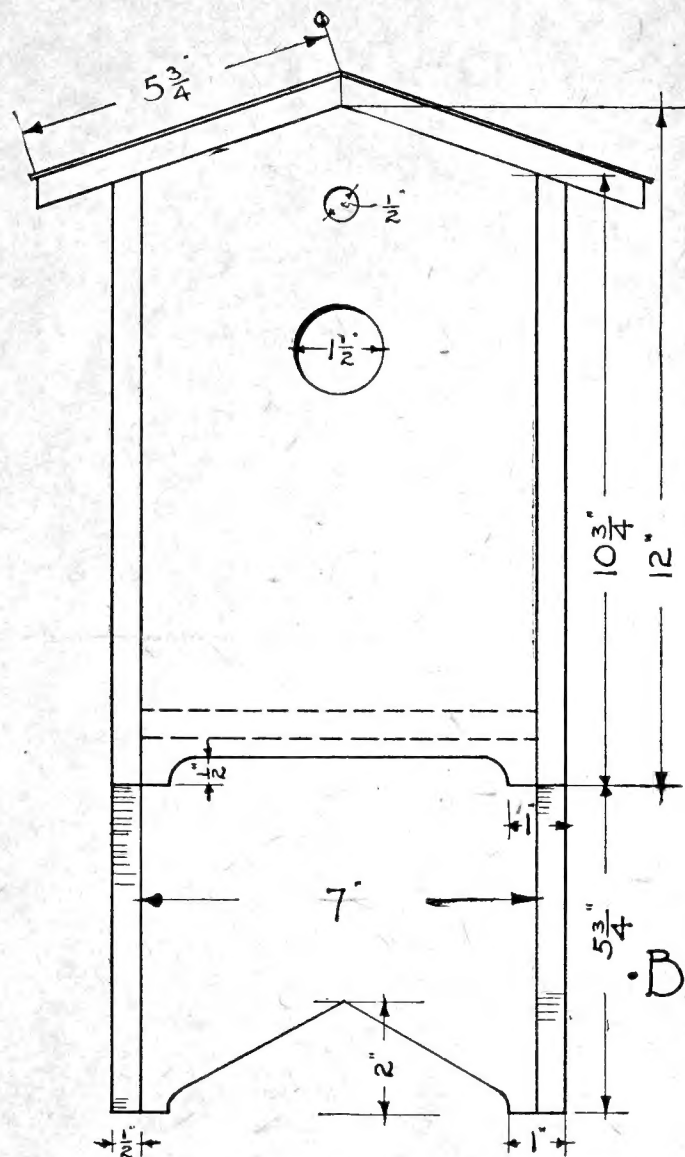
2. Fit the roof on carefully, and screw or nail in place. Keep the back end of the roof even with the back of the house, and let the front ends of the roof project over as shown in the drawing. This protects the entrance hole from the direct rays of the sun, and also keeps out the rain.

3. Fit the bottom board in next, and fasten with a few small screws. This will allow you to take out the bottom after the birds have gone, and give the house a thoro cleaning.

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*"The birds — that make sweet music for us all,  
In our dark hours — as David did for Saul."*





• BLUE BIRD HOUSE •



# BLUEBIRD HOUSE

Here is a bluebird house that will be attractive to the birds, if put up in a quiet spot and protected from cats and sparrows.

Sparrows always are the first tenants in a new house of this sort, so you must watch and not let them become established. They drive away the more desirable birds.

| Pieces | Finished Sizes—In.                                  | Use    |
|--------|---|--------|
| 1      | $\frac{3}{8}$ "x7"x17 $\frac{3}{4}$ "               | Back   |
| 2      | $\frac{1}{2}$ "x7"x16 $\frac{1}{2}$ "               | Sides  |
| 1      | $\frac{1}{2}$ "x7"x12"                              | Front  |
| 1      | $\frac{1}{2}$ "x6"x7"                               | Bottom |
| 2      | $\frac{1}{2}$ "x5 $\frac{3}{4}$ "x8 $\frac{3}{4}$ " | Roof   |

## Hardware and Tools

Hardware—One and one-fourth inch brads, one inch screws.

Tools—Rule, pencil, square, saw, plane, coping saw, brace, expansion bit, one-half inch auger bit, hammer, nail set and screw driver.

## Construction

Cutting stock—Cut out all the pieces and square them up to the finished sizes given. Lay out and cut the curves on the sides and front very carefully with the coping saw. Be sure and sandpaper these curves smooth before assembling the house.

The top ends of the front and back pieces must be cut just alike, so the roof will fit on correctly.

The bottom end of the back is left longer than the house to allow for fastening it to a tree or post.

Make the entrance and ventilation holes in the front and sides, and be sure each piece is the exact size and shape required on the drawing before attempting to put the house together.

## Assembling

1. Nail the sides on the edge of the back piece, keeping bottom end of sides and back even. (Follow the drawing carefully.)

2. Nail the front of the house between the sides. Keep the edges even and be sure the joints are tight. The bottom of the front comes even with the top of curve tight. The bottom of the front and back pieces must be exactly in line in order that the roof will fit perfectly.

3. Fit on the two roof boards and see that all joints are tight before nailing them in place.

4. The bottom piece should fit between the sides, front and back, and fastened in place with one inch screws, so it can be taken out when cleaning out the house.

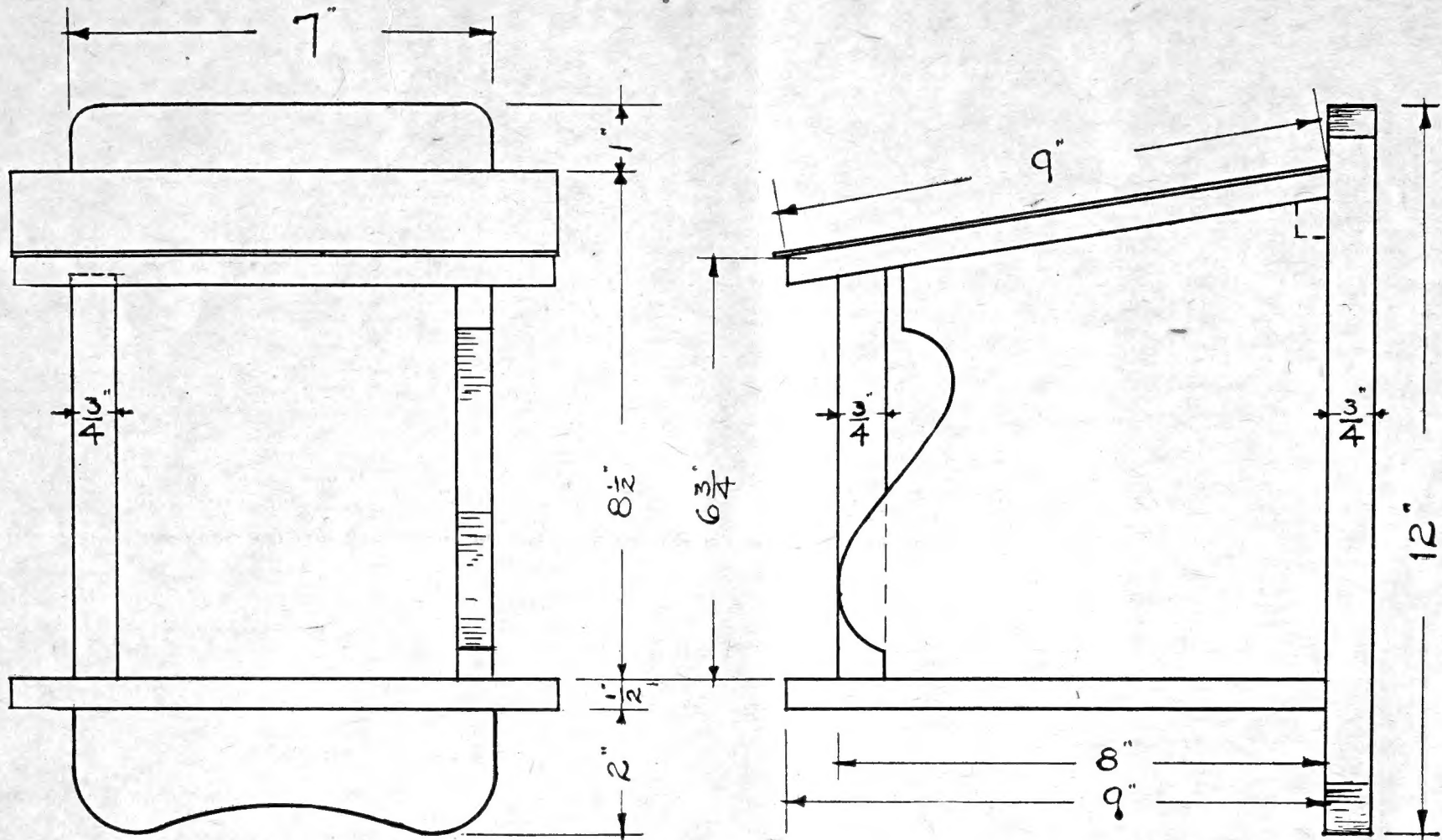
Be very particular with the curves on the sides, back and front, as the whole appearance of the house may be spoiled if these curves are uneven and not exactly alike.

## Finishing

Carefully sandpaper all the joints and curves even. Set all the nails, putty the holes and paint the body of the house white and the roof green.

The house may be stained dark brown and the roof covered with roofing. It will be less liable to leak in rainy weather.

Fasten the house to a tree or post about eight or ten feet above the ground and be sure it is protected from cats and squirrels.



• ROBIN SHELTER •

# ROBIN SHELTER

Robins, barn swallows and phoebes will not occupy an enclosed bird-house, so we will have to provide an open nesting box to suit the needs of these birds.

The drawing in this issue provides shelter for these birds, and can either be placed in a tree for the robins or under the eaves of the barn for the swallows and phoebes.

Everyone who plants a garden this spring should have a family of robins close by to help exterminate the worms and bugs that destroy plant life. This shelter is easy to make if the directions are followed carefully.

## Material Required

| Pieces | Finished Size—In.                                  | Use         |
|--------|--|-------------|
| 1      | $\frac{3}{4}$ "x7"x12"                             | Back        |
| 1      | $\frac{3}{4}$ "x $\frac{3}{4}$ "x6 $\frac{3}{4}$ " | Corner post |
| 1      | $\frac{1}{2}$ "x8"x8"                              | Side        |
| 1      | $\frac{1}{2}$ "x9"x9"                              | Bottom      |
| 1      | $\frac{1}{2}$ "x9"x9"                              | Roof        |
| 1      | $\frac{1}{2}$ "x $\frac{1}{2}$ "x6 $\frac{1}{2}$ " | Roof strip  |

## Hardware, Etc.

1 $\frac{1}{4}$  inch brads.

Tools—Rule, pencil, square, saw, plane, hammer, and coping saw.

## Construction

**Cutting Stock.** Cut out each piece of stock needed and square up to the finished size. If you do not have any lumber that is  $\frac{3}{4}$  inch thick,  $\frac{1}{2}$  inch will do just as well, for the back and front post.

## Laying Out

After you have squared up the lumber to the finished sizes, mark each piece the exact size and shape as shown on the drawing, and saw or plane each piece according to the lines, in order to get the pieces to the correct shape and size.

The design on the side and back of this shelter must be carefully marked out like the drawing, and cut out with a coping saw. Sandpaper each piece smooth before starting to assemble the shelter.

## Assembling

1. Measure up 2 $\frac{1}{2}$  inches from the bottom end of the back, and nail on the side. Keep the side and edge of the back piece even.

2. Next nail on the bottom piece and be sure it extends the same distance past the back on both ends. Drive the nails thru the back of the shelter into the bottom, and thru the bottom of the shelter into the side piece.

3. Nail the roof strip on the back 1 $\frac{1}{2}$  inches from the top edge of the back and be sure this strip is the proper shape or the roof will not fit perfectly.

4. Fit and nail the roof on next. The roof must fit on the side and back of the shelter perfectly tight, in order to be weather proof. To nail the roof on, drive the nails thru the back of the shelter into the top edge of the roof, and down thru the top of the roof into the side piece.

5. The corner post is fastened on by nailing up thru the bottom board, and down thru the roof.

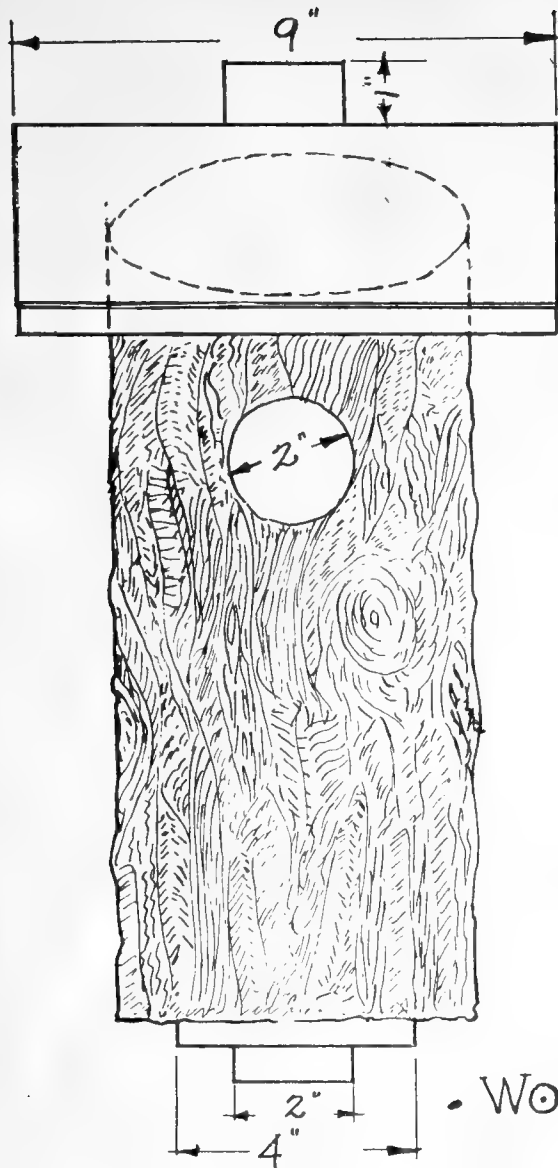
Before nailing on this post be sure it is in line with the outside edge of the back piece, and be careful to have it the correct length. The appearance of the shelter will be spoiled if this post is too short, or too long, or if it is not in line with the outside edge of the back piece.

## Finishing

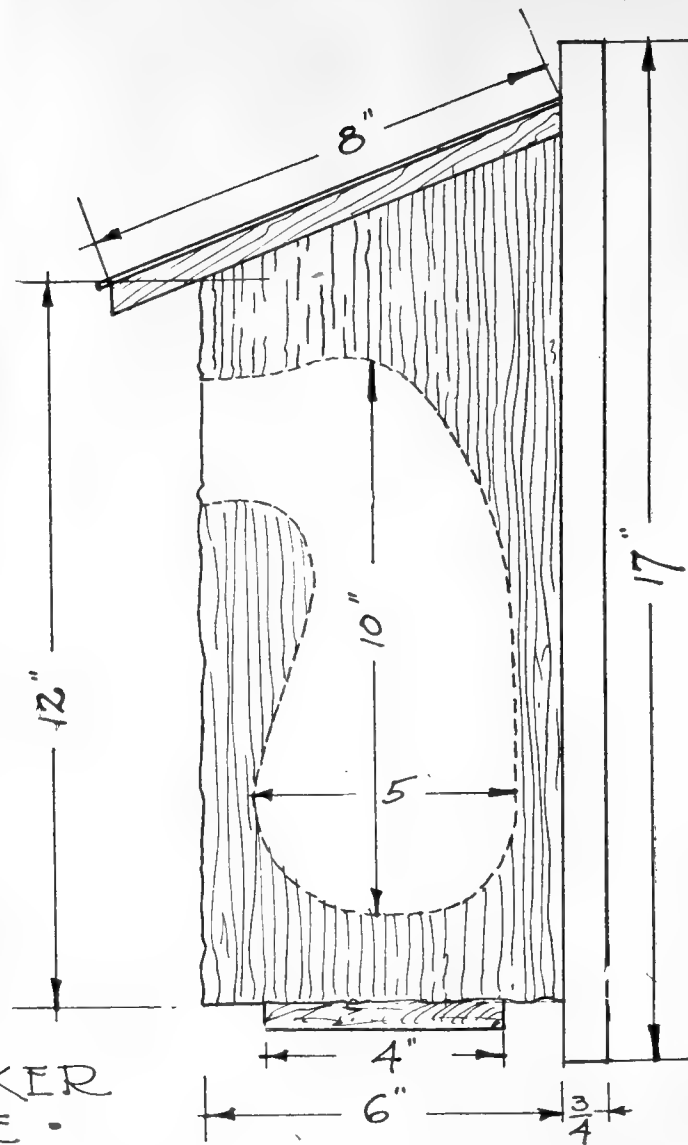
Stain this shelter a dark brown or paint it a dull gray. If it is to be used for robins fasten it in the crotch of a tree about ten feet from the ground, and be sure it will be well shaded and protected from wind and rain during the nesting season.

Sandpaper all the joints even, putty all of the nail holes, and stain the house a dark brown or green on the outside only. Cover the roof with a good waterproof roofing, and follow the same direction for fastening to a tree or post, as were given for the wren house on the preceding page.





• WOOD PECKER  
HOUSE •



# WOODPECKER HOUSE

Here is a house that is designed especially for Mr. and Mrs. Woodpecker. It is exactly the same kind of a house that the woodpeckers would build for themselves in a hollow tree.

These birds are very beneficial to orchards because they live on the insects which destroy fruit trees.

On account of so many of the dead trees being cut down these birds do not have a suitable place to build their nests. It is therefore necessary to furnish these birds with a nest box as near like the one nature furnished them, because this species of birds are fast disappearing.

## Material Required

Lumber—Limb of an oak, hickory or walnut tree. Two pieces of white pine or cypress.

| Pieces | Finished Sizes—In.       | Use           |
|--------|--------------------------|---------------|
| 1      | Log 6" or 8" in diameter | Body of house |
| 1      | $\frac{1}{2}$ "x8"x9"    | Roof          |
| 1      | $\frac{3}{4}$ "x2"x17"   | Back strip    |
| 1      | $\frac{1}{2}$ "x2"x4"    | Bottom strip  |

## Hardware, Etc.

1½ inch brads.

1 inch screws.

Tools—Rule, pencil, saw, plane, square, hammer, 1 inch gouge and screwdriver.

## Cutting Stock

1. Cut out the roof, back and bottom strips and square up to the finish size.

2. Take a piece of straight grained oak, hickory or walnut, about 6 inches in diameter, saw one end off nice and straight and the other end on slant as shown in the sectional view of the drawing. Either saw or split the piece exactly in the center, then cut out the cavity with the one inch gouge. You can get the two cavities to match exactly by making a pattern or templet the size and shape shown in the drawing. By placing it on the pieces and marking around it both cavities will match after being cut out when putting the two halves together again.

## Assembling

After cutting out the cavity carefully, be sure both sides are exactly alike and the two halves fit together nicely before fastening the log together. The two halves should be placed in a vise and clamped together tightly before putting on the roof and the bottom strip. These pieces should be screwed on so they may be removed after the nesting season and the house taken apart to be cleaned out.

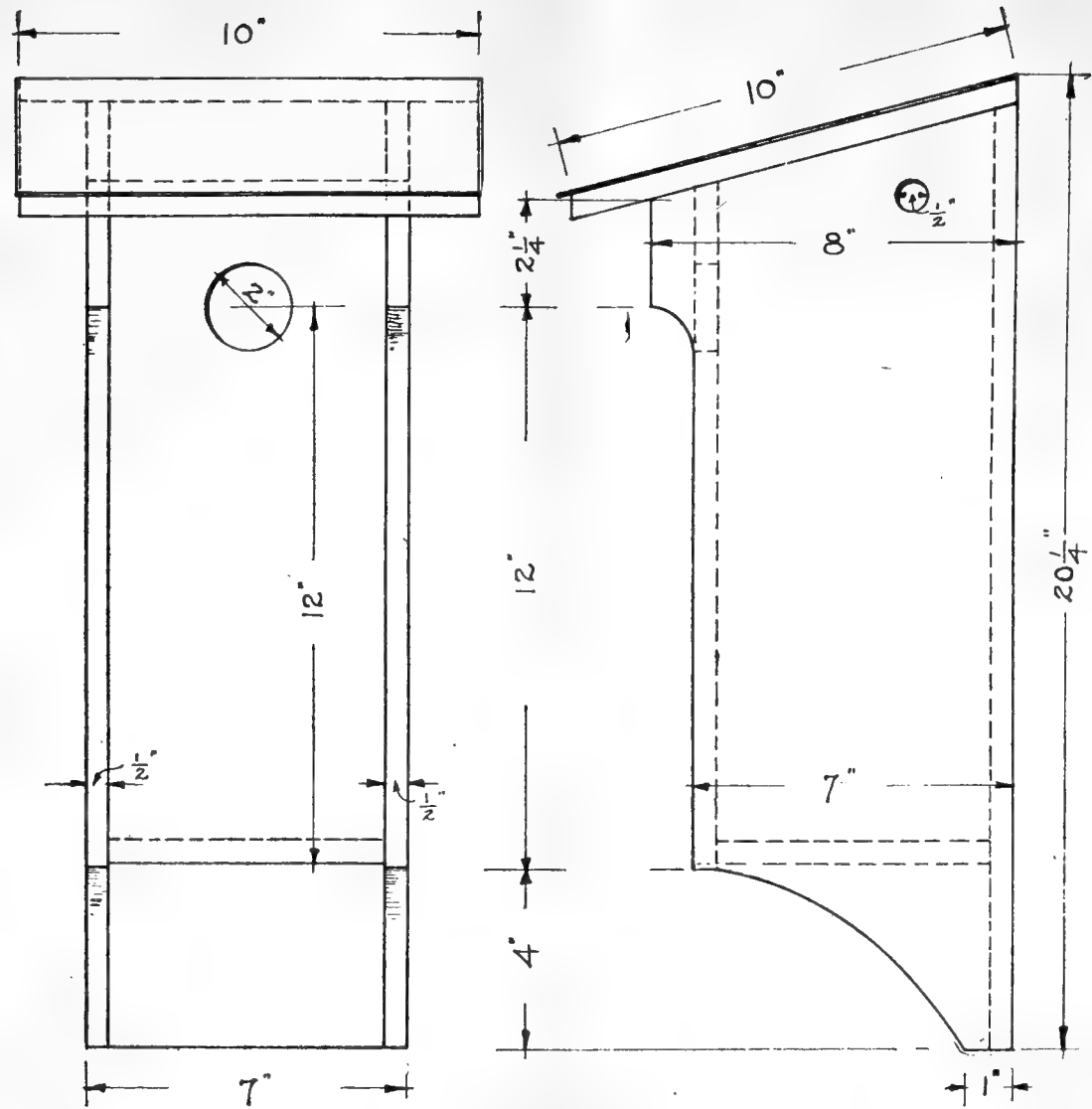
The back strip is nailed on to the house last. It is put on the back of the house to provide a way to fasten the house to a tree.

## Finishing

Stain the roof, bottom and back strips a dark brown and nail the house in a tree from ten to twenty feet above the ground.

Before putting this house up put about one inch of fine shavings or sawdust in the bottom of the cavity, because when woodpeckers peck their own nests they always leave a certain amount of the fine chips in the bottom of the house. Then they finish their nests with feathers plucked from their own bodies, and they do not gather any other nest materials.

Be sure and leave the bark on the piece that the body of the house is made of.



• FLICKER HOUSE.



# FLICKER HOUSE

A large number of these houses should be put up in orchards, for these birds, are one of the most valuable protectors of fruit trees that the farmer has to depend on.

The flicker and woodpecker generally build their nests in a hollow tree, and are most particular about the kind of houses to build their nests in.

We must therefore build a house that is as near like the one nature provides for them in a hollow tree as possible.

## Material Required

Lumber—White pine or cypress.

| Pieces | Finished Size—In.                     | Use    |
|--------|---------------------------------------|--------|
| 1      | $\frac{1}{2}$ "x6"x20"                | Back   |
| 1      | $\frac{1}{2}$ "x6"x14 $\frac{1}{2}$ " | Front  |
| 2      | $\frac{1}{2}$ "x8"x20"                | Sides  |
| 1      | $\frac{1}{2}$ "x6"x6"                 | Bottom |
| 1      | $\frac{1}{2}$ "x10"x10"               | Roof   |

Hardware and tools required: 1 $\frac{1}{4}$  inch brads; 1 inch screws.

Tools—Rule, pencil, square, saw, plane, hammer, brace, 2 inch expansion bit, coping saw and screw driver.

(Note)—The expansion bit is for boring the entrance hole in the front of the house. If you do not have an expansion bit, the hole may be cut out with a coping saw or pocket knife.

## Construction

**Cutting Stock.** Cut all the pieces according to the finished sizes given. The curves on the two sides must be carefully marked out before cutting out with the coping saw. All saw marks should be sandpapered off, and

the entrance hole in the front cut out before putting the house together.

## Assembling

**First:** Be sure all the pieces are square and the right shape and size.

**Second.** Nail the two sides on the back, keeping the edges even and the joints tight. The back of this house fits inside of the sides as you will notice on the drawing, and the bottom ends of the sides and back must be kept even.

**Third.** The front should be nailed between the two sides even with the outside edges, and just a little bit above where the curve starts on the bottom end of the sides. The curve on the top end of the sides should project out 1 inch from the front of the house.

**Fourth.** Fit the roof on next and before nailing it in place be sure it fits tight, and is weather-proof. The back edge of the roof comes even with the back of the house and projects 1 $\frac{1}{2}$  inches over the sides and front of the house.

**Fifth.** Fit the bottom of the house snugly between the sides, back and front, and fasten it in even with the bottom end of the front with a few 1 inch screws. These screws can be removed, and the bottom taken out at housecleaning time.

## Finishing

Before painting or staining the house, see that all nail holes are puttied, and all joints are even, and tight. Paint the body of the house white, and the roof green, or stain the house a dark brown and cover the roof with roofing. Do not paint or stain the inside of any of these houses.

On account of the curved sides it will be impossible to cover this house with bark, but before putting the house up, put about 2 inches of fine chips or sawdust in the bottom. When woodpeckers make their own nests they always leave a certain amount of fine chips in the bottom, and cover this with feathers plucked from their own bodies. They do not gather any other nest material.

Fasten this house to a tree about 10 or 12 feet from the ground.



# DOUBLE CHICKADEE HOUSE

Here is a design for a chickadee house that is not only pleasing to the eye, but will also be attractive to these desirable birds.

The chickadees are often known to nest in double houses and will stay all winter providing they are fed and sheltered.

The upper part of this house has two rooms for the nests, while on the lower part a roost is provided where the birds may find shelter from the cold winds and stormy weather.

The front of this house should face the south, or should be placed where it would be shaded in the summer and sunny in the winter.

## Material Required

Lumber— $\frac{1}{2}$  inch cypress or white pine.

| Pieces | Finished Sizes—In.                                   | Use           |
|--------|--|---------------|
| 1      | $\frac{1}{2}$ "x9"x14"                               | Back          |
| 2      | $\frac{1}{2}$ "x5 $\frac{1}{2}$ "x14"                | Sides         |
| 1      | $\frac{1}{2}$ "x7 $\frac{1}{4}$ "x11 $\frac{1}{4}$ " | Front         |
| 1      | $\frac{1}{2}$ "x8 $\frac{1}{4}$ "x12 $\frac{3}{4}$ " | Roof          |
| 1      | $\frac{1}{2}$ "x5"x9"                                | Bottom        |
| 1      | $\frac{1}{2}$ "x4 $\frac{1}{2}$ "x7"                 | Partition     |
| 1      | $\frac{3}{8}$ "x $\frac{3}{8}$ "x10"                 | Rod for Perch |

## Hardware, Etc.

1 $\frac{1}{4}$  inch brads.

1 inch screws.

Tools—Rule, pencil, square, saw, plane, hammer, brace,  $\frac{1}{2}$  and  $\frac{3}{8}$  inch auger bits, 1 $\frac{1}{8}$  inch expansion bit, coping saw, nail set, and screw-driver.

## Construction

**Cutting Stock.** Before cutting the lumber, study the drawing carefully. Be sure you have the front and sides marked out accurately before starting to cut them out. The bottom edge of the front, and the curve on the side pieces and front, should be carefully cut out with a coping saw. After sawing these piece out sandpaper the saw marks from the edges so they will have a smooth surface for staining or painting.

Before starting to put the house together see that you have all the pieces necessary, and they are the correct size, shape, and perfectly square.

Bore the entrance, ventilation, and perch holes in the two sides before starting to assemble the house.

If you do not have an expansion bit for the entrance hole draw a 1 $\frac{1}{8}$  inch circle, bore a hole inside the circle with a small bit, insert the coping saw blade, and you can cut the hole out with a saw.

If you use the coping saw for cutting the entrance hole don't forget to sandpaper the edge of the hole smooth.

## Assembling

1. Nail the two sides on the back pieces, having the ends and edges of sides and back even. The back piece of this house fits between the two side pieces.

2. Nail the front on the two sides, and keep the top edge of the front piece exactly even with the slanted top end of the sides. This part of the assembling must be carefully done in order to make the roof fit accurately.

3. Fit and nail in the bottom next. The bottom must fit tight between the two sides, back, and front. The bottom must be nailed exactly as shown in drawing.

4. Fit and nail in the partition next. It is not necessary to have the partition go up to the roof.

5. Before fastening on the roof see that it fits tightly all around in order to keep out the wind and rain. It should be fastened to the house with a few one inch screws so it can be easily taken off to clean out the house.

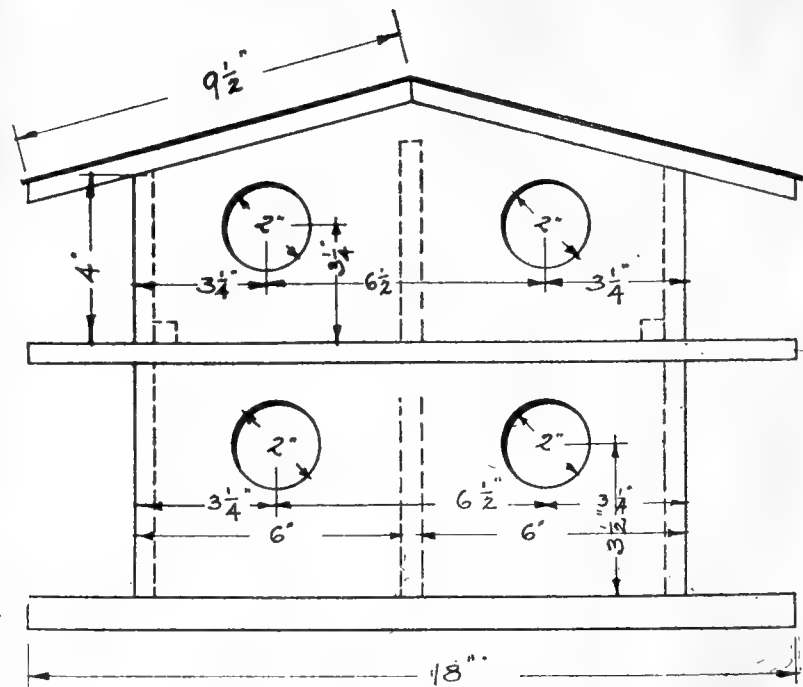
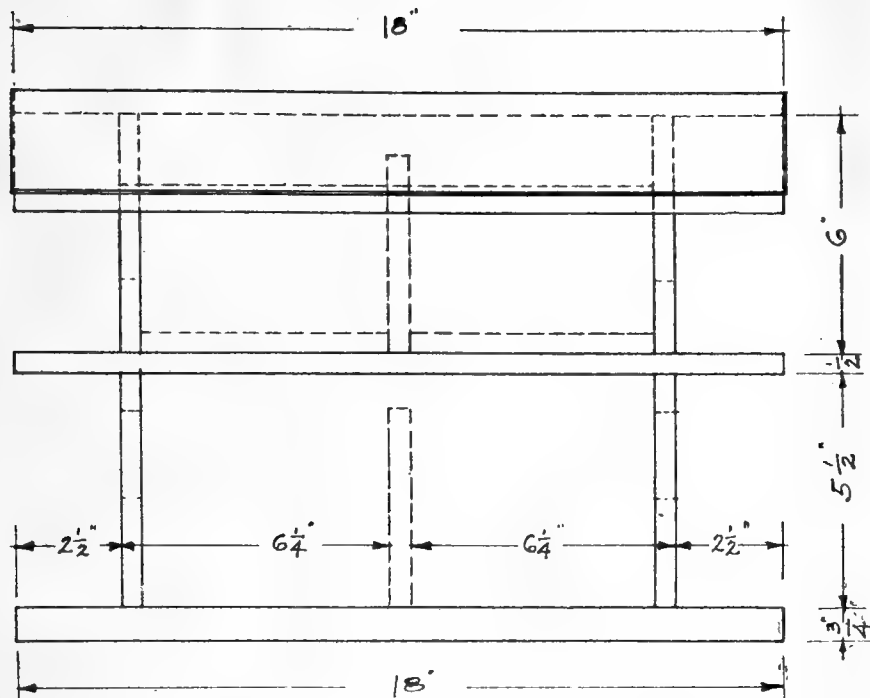
6. Put the perch on last. This perch is made from a piece of dowel rod and should be just as long as the roof. It should stick out the same distance on each side, and can be held in place by driving a small brad thru the front edge of the side.

## Finishing

Carefully set all nails, fill all the holes with putty, and sandpaper off all tool marks. If any of the joints are not even they can be made even and smooth by sandpapering. The body of the house should be stained or painted a dark green. The roof and perch a dark brown. The roof will give better service if covered with roofing or an asphalt shingle. On account of the curved sides it will not be practical to attempt to cover this house with bark, and do not paint or stain the house on the inside. Fasten the house on the sheltered side of a tree about 10 or 12 feet above the ground and protect from the cats.



# MARTIN HOUSE.



# MARTIN HOUSE

Martins like to nest in colonies, so we must build them a house with a number of separate rooms if we hope to make them a home that will be attractive.

In building a martin house there is no limit as to size or style of architecture that may be used. Your house may contain any number of rooms above four that you care to build, or it may be as plain or fancy as you wish to build it.

Unless you are an experienced builder it will not be wise for you to try to construct a large and elaborate house, because a small and plain house will be just as attractive to the martins, and not as expensive to build as a large and fancy one.

The drawing given in this lesson is of an eight room martin house.

## Material Required

Lumber—White pine or cypress.

| Pieces | Finished Sizes—In.                                 | Use          |
|--------|--|--------------|
| 1      | $\frac{3}{4}$ "x18"x18"                            | Bottom Floor |
| 1      | $\frac{1}{2}$ "x18"x18"                            | Upper Floor  |
| 2      | $\frac{1}{2}$ "x5 $\frac{1}{2}$ "x13"              | Lower Fronts |
| 2      | $\frac{1}{2}$ "x5 $\frac{1}{2}$ "x12"              | Lower Sides  |
| 2      | $\frac{1}{2}$ "x6"x13"                             | Upper Fronts |
| 2      | $\frac{1}{2}$ "x4"x12"                             | Upper Sides  |
| 2      | $\frac{1}{2}$ "x9 $\frac{1}{2}$ "x18"              | Roof Boards  |
| 2      | $\frac{1}{2}$ "x5"x12"                             | Partitions   |
| 4      | $\frac{1}{2}$ "x5"x5 $\frac{1}{2}$ "               | Partitions   |
| 4      | $\frac{1}{2}$ "x $\frac{1}{2}$ "x5 $\frac{1}{2}$ " | Strips       |

## Hardware, Etc.

One and one-fourth inch brads.

One inch and one and one-fourth inch screws.

Tools—Rule, pencil, square, saw, plane, brace, 2 inch expansion bit, hammer, nail set, screwdriver and coping saw.

Before cutting any stock study the drawing carefully. Cut out the large pieces first. The two 18 inch square bottom pieces will have to be made out of two or three separate pieces, either glued or fastened together with corrugated fasteners, as it is almost impossible to get lumber 18 inches wide.

It is the better plan to cut out, and put together the lower part of the

house first. Then you are not as liable to lose any of the different pieces, as you will be if you cut out all of the different parts before starting to assemble them.

Be sure to bore the entrance holes in the four front pieces, and have the two fronts of the top section cut the proper shape for the roof to fit on, before nailing the house together.

The entrance holes must be bored very carefully from both sides, as the fronts of the house are liable to split. If you do not have an expansion bit cut the entrance holes out with a coping saw, and do not forget to sand-paper the edges of the holes after sawing.

## Assembling

1. Before nailing the house together see that every piece is the correct size and shape. All ends and edges must be straight and square.

2. Assemble the bottom section first. Nail the two sides between the two front pieces, keeping the outside edges even. Drive nails thru the front piece into the end of the side pieces.

3. Fit and nail in the partitions next and be sure they divide the lower floor into four equal parts before nailing them in place.

4. The top floor is now nailed to the bottom section by nailing down thru the top side of the floor into the sides, and ends of the lower section.

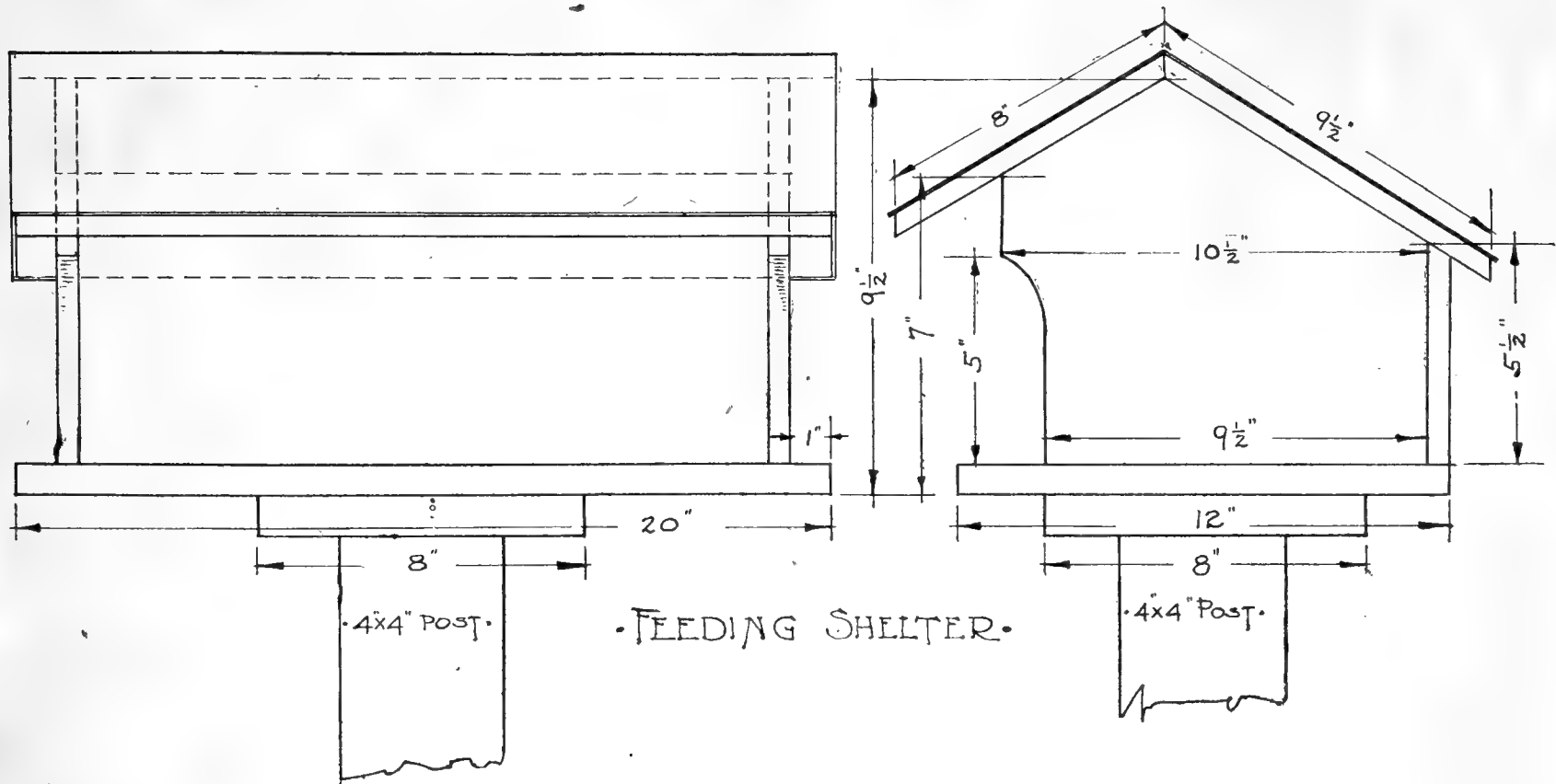
If you have followed the drawings and measurements carefully there will be a projection of 2 $\frac{1}{2}$  inches on the top and bottom floors all around the outside of the house. This makes the porch around the house for the young birds to light upon when learning to fly.

5. The bottom floor is now fastened to the lower section of the house with 1 $\frac{1}{4}$  inch screws to allow for its removal at house cleaning time. It should have the same projection from the body of the house as the top floor has.

6. Nail the sides on the top section between the two fronts. Be sure you have these pieces the correct shape and size or you will have trouble when you fit on the roof.

7. Put in the partitions just as you did on the lower section. It is not necessary to have the partitions as high as the sides, because it makes a better ventilated house by leaving about one inch space on the top of the partitions.

(Note)—Some bird authorities say that partitions in a martin house are not at all necessary.





8. Fit the roof carefully and nail it fast to the upper section. Be sure the joint at the top of the roof is weather proof. If you do not cover the roof with roofing, nail a thin strip of wood or a strip of tin over this joint, this will keep the roof from leaking in case the two roof boards should shrink.

9. The two one-half inch strips must be nailed to the top side of the top floor, three inches in from both edges, so they will fit just inside of the two sides of the top section. A few one inch screws put thru the bottom edge of the two sides into these strips will hold the house together until it should be taken apart to be cleaned.

#### Finishing

Paint the body of the house white, the roof and porches a dark green.

## FEEDING

Feeding shelters are as important to build, and put up, as bird houses themselves. The birds that return in the early spring, are often caught in a few late cold snaps and sometimes snow storms; which cover the ground, and the food supply of the birds, who soon freeze to death because of insufficient food to warm their bodies, if no artificial means of feeding them are provided.

A feeding shelter or two should be in every farm yard. They should be well built and so placed that the open side will be protected from the cold winds, rain and snow storms, and prowling cats. The shelter in this drawing is simple in design and easy to make. The curves on the sides may be omitted if desired, but they add a little artistic touch to the appearance of the house if left on.

A few small hooks placed in the back of the house to fasten suet on, will prove to be an added attraction to the birds for your feeding shelter. All birds like suet, wheat, cracked corn, sun flower seed, and millet.

#### Material Required

Lumber—White pine or cypress.

| Pieces | Finished Sizes—In.  | Use            |
|--------|---------------------|----------------|
| 1      | 1/2"x12"x20"        | Bottom         |
| 1      | 1/2"x9 1/2"x20"     | Roof           |
| 1      | 1/2"x8"x20"         | Roof           |
| 2      | 1/2"x10 1/2"x9 1/2" | Sides          |
| 1      | 1/2"x5 1/2"x18"     | Back           |
| 1      | 3/4"x8"x8"          | Bottom support |
| 1      | 18"x20"             | Roofing        |

If the roof is covered with roofing it will not need any paint. Do not forget to paint the bottom as it is exposed to the weather after mounting the house on a post.

If the body of the house is covered with birch bark, the roof and porches covered with red asphalt roofing it makes a very attractive and durable house.

Mount the house on a post about sixteen feet above the ground, and cover the post with tin or sheet iron twenty-four inches wide, about six feet above the ground, so the cats can't disturb the birds.

(Note)—If you cover the house with bark do not leave any nails sticking thru on the inside of the house.

## SHELTER

#### Hardware and Tools

1 1/4 inch brads; 1 inch screws.

Tools—Rule, pencil, saw, plane hammer, square, coping saw, nail set.

#### Construction

Cut out each piece rough. Plane smooth on both sides, plane both edges straight, and both ends square.

After squaring each piece, mark out the exact shape as shown on the drawing; saw and plane to the lines you have laid out on the different pieces. Be sure the two sides are exactly alike so the roof will fit correctly.

#### Assembling

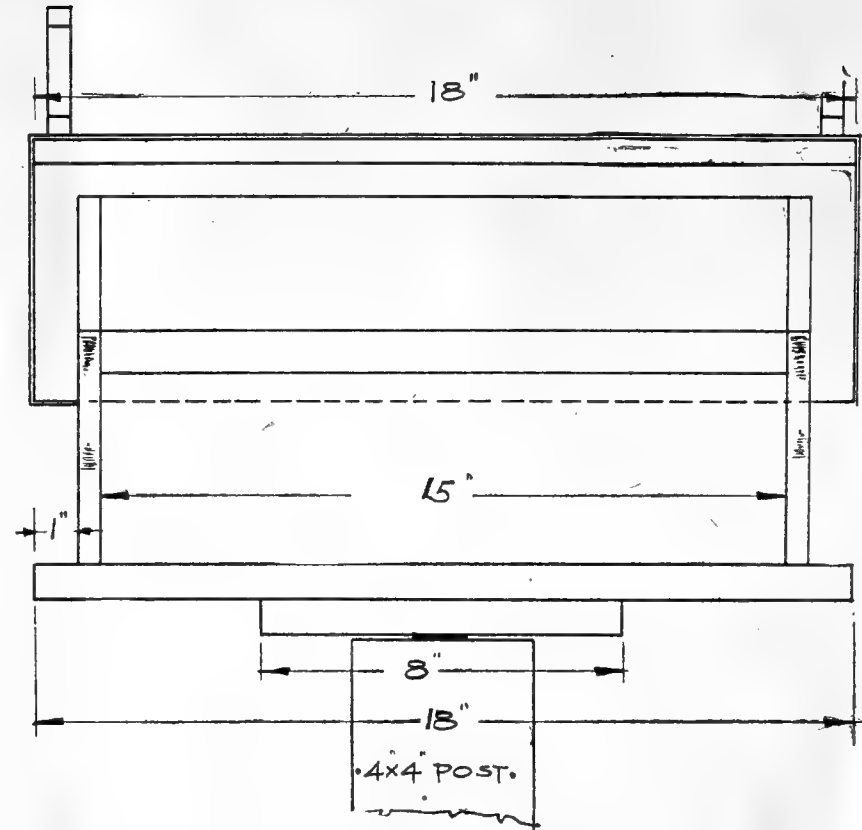
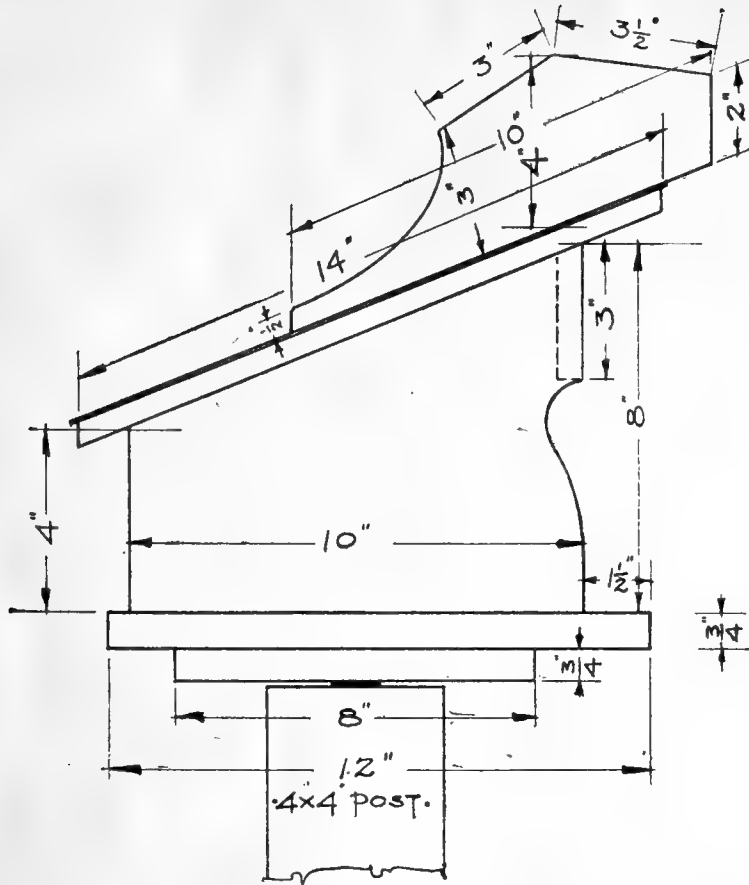
1. Nail the back piece on the back edge of the two sides keeping the bottom edges even, and the sides flush with the ends of the back piece.

2. Nail on the 9 1/2 inch roof board next, allowing it to project 1 inch over each side and 1 inch over the back of the house.

3. Nail on the front roof piece, but be sure you have the roof joint fitting perfectly tight. This piece of the roof must project 3 inches over the front to protect the opening from wind, and snow.

4. Nail on the bottom; keeping it even with the back of the house, and having 1 inch projection on the sides, and 2 inches on the front.

5. The bottom support which is 8 inches square should be screwed to the house with 1 inch screws exactly in the center on the bottom of the shelter.



• REVOLVING FEED SHELTER •

This makes the bottom thick enough to be fastened securely on top of a post.

### Finishing

Sandpaper all joints even, putty nail holes, cover the roof with roofing, and paint with two coats of white, green, or brown paint. It will be a good

idea to paint the shelter all over, as it will be a protection to the wood, and increase its lasting qualities.

Place this shelter on a post with its back to the prevailing winds. Keep it well supplied with food in the winter, guard it from cats, and you will have many of the birds stay with you the year around.

## REVOLVING FEEDING SHELTER

This shelter is designed to revolve with the wind the same as a weather vane. The back of the shelter will always be to the wind which keeps the inside perfectly dry, and affords a place to feed, that the birds readily take to.

It is built on the same plan as the other shelter with the exception of the roof, and the two wings on the top.

### Material Required

Lumber—White pine or cypress.

| Pieces | Finished Sizes—In.      | Use            |
|--------|-------------------------|----------------|
| 1      | $\frac{1}{2}$ "x14"x18" | Roof           |
| 1      | $\frac{1}{2}$ "x12"x18" | Bottom         |
| 1      | $\frac{1}{2}$ "x8"x8"   | Bottom support |
| 2      | $\frac{1}{2}$ "x10"x8"  | Sides          |
| 1      | $\frac{1}{2}$ "x4"x15"  | Back           |
| 1      | $\frac{1}{2}$ "x3"x15"  | Front          |
| 2      | $\frac{1}{2}$ "x4"x10"  | Wings          |
| 1      | 14"x18"                 | Roofing        |

### Hardware and Tools

1½ inch brads; six 1 inch and 1 3 inch screws.

Tools—Rule, pencil, square, saw, plane, hammer, screwdriver coping saw. Nail set and brace and bit to bore screw holes.

### Construction

Follow the same rules for construction that are furnished for shelter on the preceding page, except the wings on the roof should be cut out just as shown in the drawing, and the curves on wings, and side pieces should be sandpapered smooth after sawing out with coping saw.

The two wings should be exactly alike, and also the side pieces.

### Assembling

1. Nail the two sides on the ends of the back piece, keeping the outside corners, and bottom edges even.

2. Nail front piece between the two sides even with the front, and top edges of the sides.

3. Nail on the bottom allowing ½ inch projection on the back, 1 inch on the sides and 1½ inches in the front. Next screw on the bottom support with a 1 inch screw in each corner. Have this piece exactly in the center of the bottom.

4. Bore a ¼ inch hole in the center of the bottom clear thru bottom support. This hole is to put the large screw thru into the top of the post, so the shelter can revolve in the wind.

5. Fit the roof on carefully, and fasten into place, cover the roof with roofing before fastening on the wings.

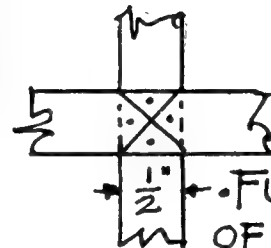
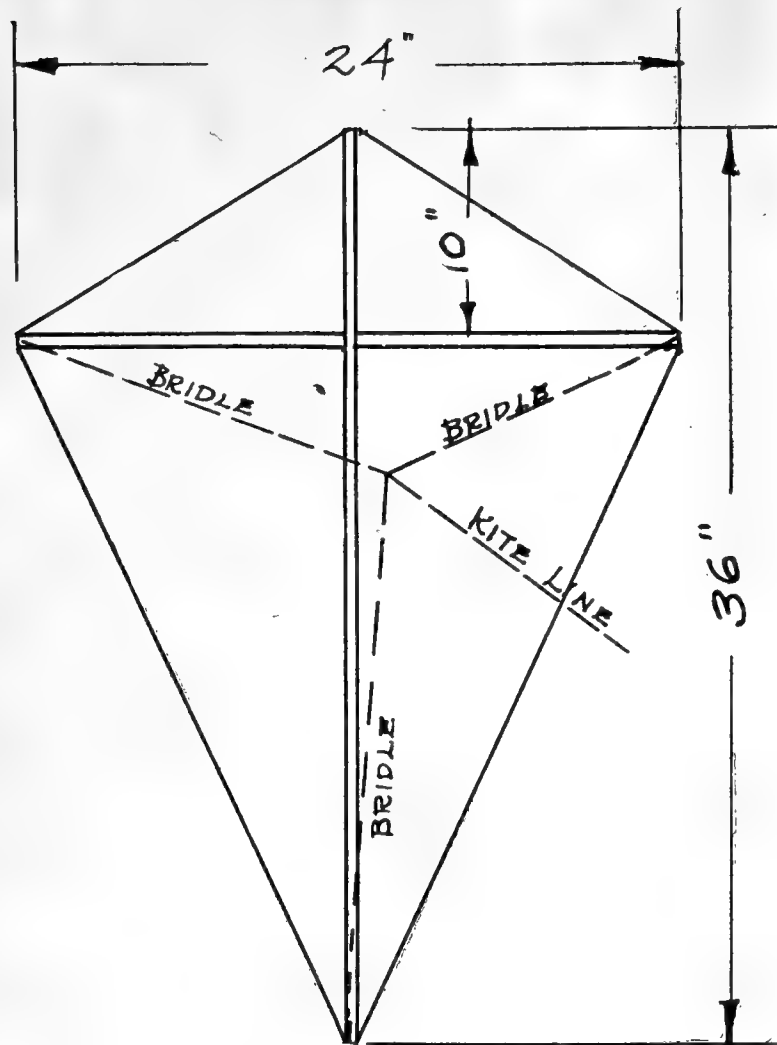
6. The two wings are fastened to the roof by screwing up thru the under side of the roof into the bottom edge of wings with three 1 inch screws. Follow the drawing carefully while putting this shelter together.

### Finishing

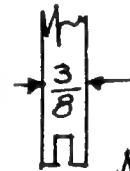
Finish according to directions given for the preceding shelter.

Screw this shelter on top of a post that has been sawed off square, using a 3 inch screw, and place an iron washer under the head of the screw, and between the top of the post and the bottom of the house. Don't make the screw too tight or shelter will not move when the wind blows.

These shelters should be placed near the house, where it is convenient to replenish the stock of food. A great deal of enjoyment can be had if the shelter is situated so you can watch the birds feed on stormy winter days, from the window.



• FULL SIZE DETAIL  
OF CENTER JOINT.



NOTCH FOR STRING  
ON ENDS OF KITE STICKS.

• TWO STICK FLAT KITE.

# HOW TO BUILD A KITE THAT WILL FLY

Before starting to build a kite it is well to know a few of the fundamental things about the size, shape, and materials that are required to make a kite that will fly successfully.

The most important part is the framework. This should be made of wood that is both light and strong. The different pieces of the frame work must also be uniform in thickness, width and length, because a piece that is thicker or wider at one end than it is at the other will over-balance the kite and cause it to dart to the ground and be broken.

Split bamboo is the best wood for kite making, altho it is very difficult to fasten the joints together. White pine, white cedar, yellow pine, spruce, and cypress are probably the best woods that can be procured in this locality for making kites.

Putting the string around the frame work is the next important thing. The distance from the top of the upright piece to the end of the cross piece must be the same on both sides, and the same is true of the bottom part of the kite. If the sides of the frame work are strung unequally the kite will pull-off to one side and dart, or will not fly at all. The best cord to string a kite with is a piece of small, hard twisted fish line.

Next to be considered is the covering. Silk of course is the ideal cover, but a good quality of strong tissue paper answers the purpose just as well. If you build a large kite a good strong wrapping paper will do for the cover, or a piece of cambric is also an excellent material to use; but if used it should never be put on the bias, as it is liable to unequal stretching and will unbalance the poise of the kite.

The bridle, or bellyband, is the next important thing about a kite. All kites must have a bridle as it is impossible to fly a kite with the kite line tied directly to the kite frame. The kite is dependent on the bridle for the

proper distribution of pull by the kite line, and it also gives the proper tilt of the exposed surface of the kite to the breeze. The kite line may be fastened to the bridle a little above the normal point to make it fly directly overhead, and to make it fly low fasten the kite line below the normal point.

The kite line should be light and strong; for small kites a four ply wrapping string is most commonly used and is very satisfactory for kites up to three feet. The hard twisted four-ply fishing twine is the best and of course the strongest, but is rather expensive. It does not tangle up as easily as the cheap string and will not burn the hands when letting out the line.

A reel to wind the kite line on is very useful, but is not necessary. It makes the kite line easier to hold, keeps it from getting tangled, and the line can be taken in, or let out much faster than by the old fashioned string wind.

The tail comes next and is very important as kites having flat surfaces exposed to the breeze will not keep their poise unless balanced at the bottom by the addition of a tail. The tail can be made of a string with a number of pieces of paper 4 inches wide and 8 inches long, fastened to it about every eight inches apart. At the bottom end of the tail string a few strips of cloth can be fastened for weight. In a strong wind a longer tail is needed than in a light wind. If your kite is unsteady when starting to fly pull it down and adjust the bridle or the tail. Sometimes it will require two or three adjustments before it will fly steadily.

If your kite starts to dive to the ground let go of the kite line just before it strikes. This will allow the kite to flutter down, and it will not strike the ground hard enough to be broken.

The two kites in the drawings are simple two and three stick flat kites which any boy can make with few tools, and a little time and patience.

## TWO STICK FLAT KITE

### Material Required

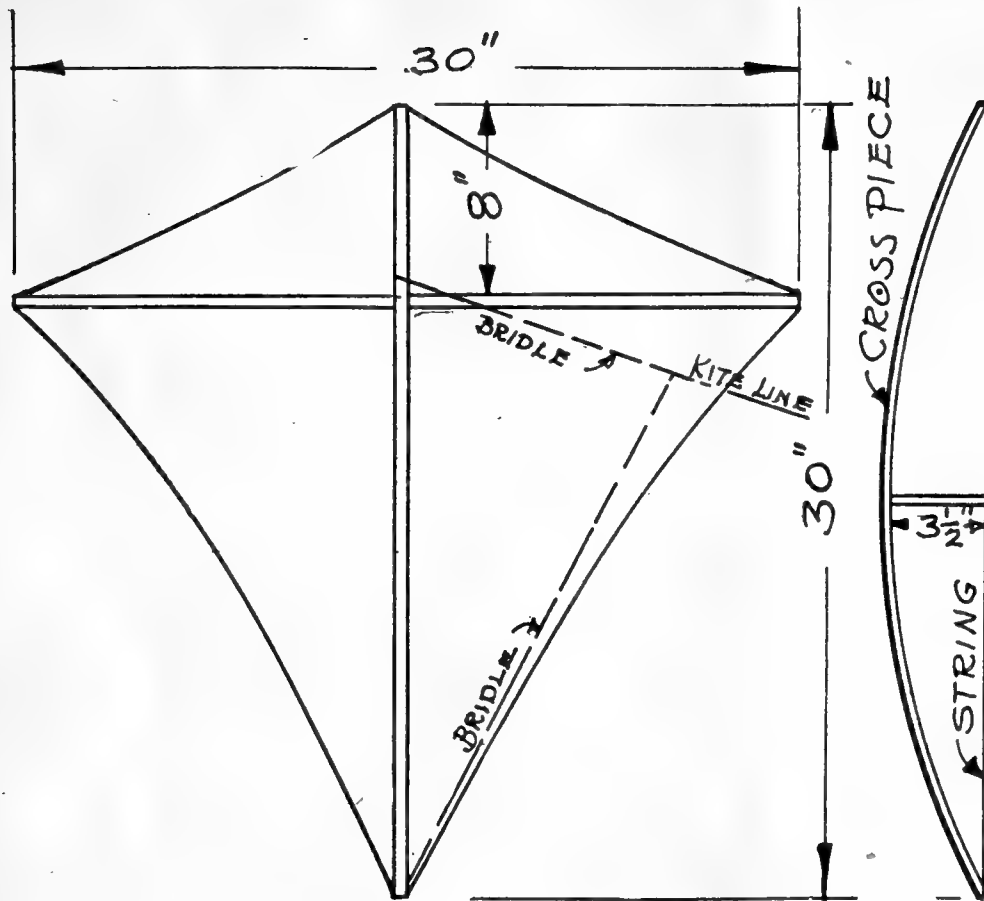
| Lumber—White pine, yellow pine, spruce, cypress or basswood. |                                       |
|--|---------------------------------------|
| Pieces   | Finished Sizes—In.                    |
| 1  | $\frac{1}{4}$ "x $1\frac{1}{2}$ "x24" |
| 1  | $\frac{1}{4}$ "x $1\frac{1}{2}$ "x36" |

Use  
Cross piece  
Upright piece

### Hardware, Etc.

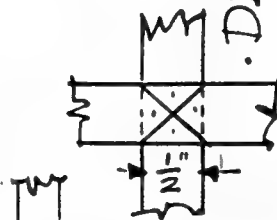
One-half inch brads.  
Strong twine.  
Tissue paper or cambric 25 $\frac{1}{2}$ x38 inches.





• TOP VIEW SHOWING METHOD  
FOR BOWING CROSS PIECE.

• DETAIL OF CROSS JOINT.



• NOTCH FOR STRING  
ON END OF STICKS.

• TAILLESS KITE •

### Construction

1. When making the two sticks for the frame be sure they are straight, the proper thickness, width and length.
2. Fasten the cross piece on the upright eight inches from the top end of one upright and exactly in the center of the cross piece with small brads.
3. Start at the top and put a good strong string around the edge of the kite frame and fasten it at the top where you started from. Now is the time to get the distances equal from point to point. When you have this adjusted, take a short piece of string and lash the ends of the kite sticks to the string around the edge of the kite. This will hold all the ends in the proper position and they are not so liable to get out of place while you are putting on the cover. The center joint where the two sticks cross can be strengthened by wrapping a piece of string around them, and covering the string with glue.
4. To cover the kite place the cover on a table top or floor, lay the kite frame on the cover and cut out the cover one inch larger all around than the kite frame.

5. Glue the cover to the sticks, fold the edge over one inch and glue fast to the string around the kite frame.

To strengthen the outside edge of the kite glue a piece of paper two inches wide all around the edge of the kite frame.

To fasten on the bridle punch a few small holes in the cover so the bridle string can be tied to the kite frame at the points shown in the drawing. It is rather a hard matter to give the exact length of the bridle, as the weight of the materials of which the kite is constructed often vary to such an extent that it takes a few trial flights to determine the exact length of the bridle and the proper point to fasten on the kite line. When the proper point for fastening the kite line to the bridle has been determined tie the line in a knot that will not slip. If the kite rises steadily but too slowly, remove some of the tail. If it rises quickly but wobbly, add more weight to the tail. Keep experimenting and don't become discouraged if your first kite is a failure.

Success comes in cans.

Failure in can'ts.

## TAILLESS KITE

The tailless kite is the most popular of all kites, because it is easy to make, flies in a very light breeze and is the steadiest kite in the air.

These kites can be made any size from five inches up to ten feet in height.

Such a kite as this has to be accurately made. The two sticks should always be the same length, and the frame should be covered with cloth.

This is the best kite to fly where there are trees, wires and houses, because it rises quickly into the air and has no tail to become tangled on any of these obstructions.

There are several types of tailless kites, but the two stick kite shown in the drawing is easy to make, and is a sure flier.

### Material Required

Lumber—Yellow pine, spruce, white cedar or cypress.

| Pieces | Finished Sizes—In.                   | Use         |
|--------|--------------------------------------|-------------|
| 1      | $\frac{3}{8}$ "x $\frac{1}{2}$ "x30" | Upright     |
| 1      | $\frac{3}{8}$ "x $\frac{1}{2}$ "x30" | Cross piece |
| 1      | $\frac{1}{4}$ "x $\frac{1}{4}$ " 3"  | Brace stick |

### Hardware, Etc.

One-half inch brads.

Strong wrapping twine.

Piece of cambric lining, 32 inches square.

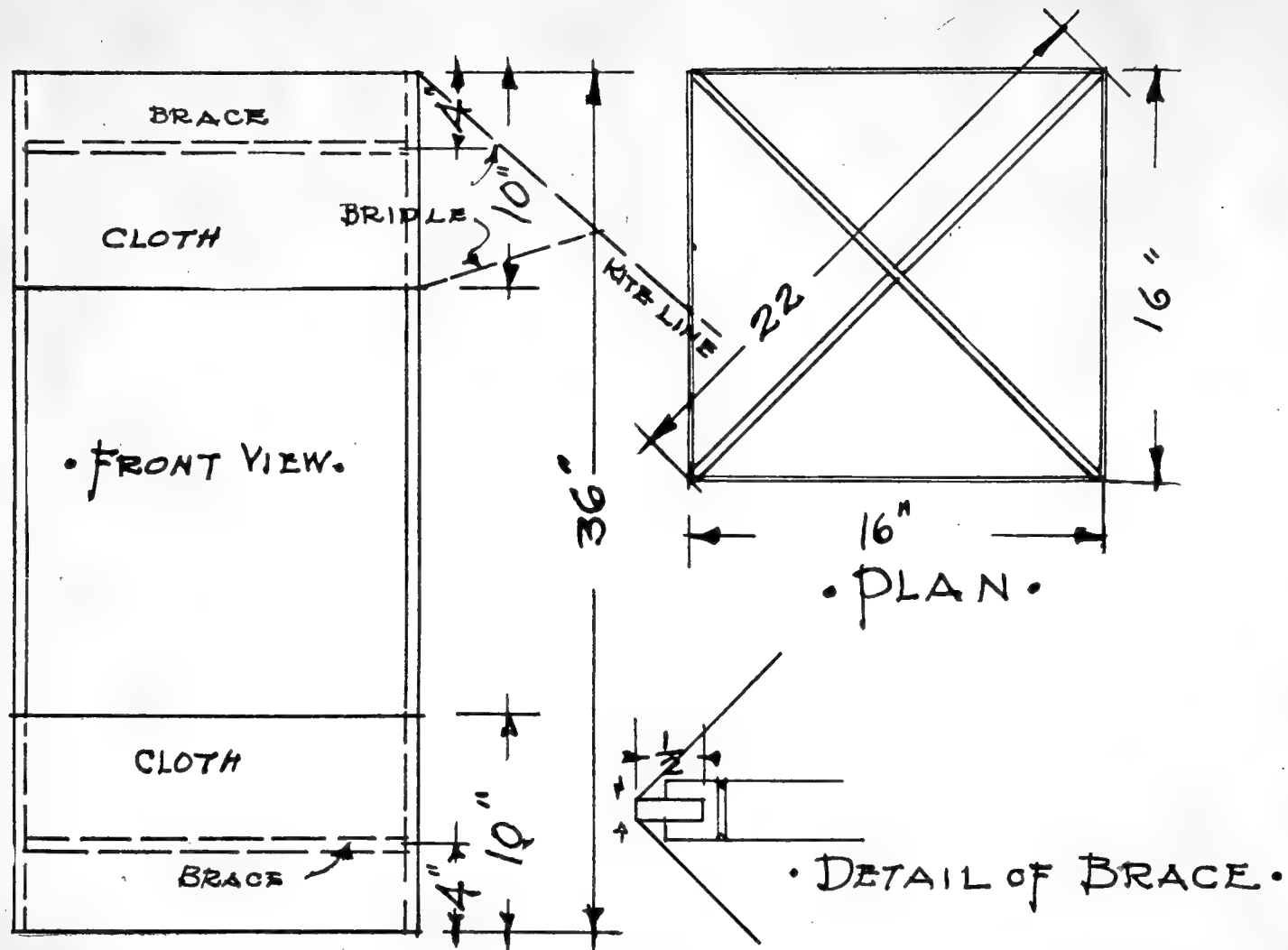
### Construction

1. Before putting the framework of this kite together be sure the cross-piece and upright pieces are straight, and the same length and width and thickness. If one stick is heavier or larger than the other it may overbalance the kite and make it unsteady while it is in the air.

2. Cut notches in the ends of upright and cross pieces for the string that goes around the edge of the kite. (See detail.)

3. Place the cross piece on the upright eight inches from the top end, and fasten with two small brads. Lash it securely into place with a piece of string wound diagonally across the joint. (See detail of cross joint.) Be sure the exact center of cross piece is fastened to the upright.

4. The frame is now ready for stringing. This string should be a stout piece of fishing line and long enough to reach around the outer edge of the framework. It must be drawn up tightly and placed in the notches that are cut in the ends of the two sticks.



• BOX KITE •

5. Now divide the distances equally from the top of the upright to the ends of the cross piece and from the bottom of the upright to the ends of the cross piece. Be sure to have the distance between these points exactly the same on both sides of the kite. When you have these points adjusted fasten them to the outside string with another cord to keep from slipping.

6. Now the frame is ready for the cover. Take a piece of colored cambric lining thirty-two inches square, lay it out on a table and place the frame on top. Cut the cover one inch larger all around than the frame. A tailless kite cover has to be put on loosely to allow for air pockets, so instead of stretching the cover tightly, just turn one-half inch of the edge over the outside string and sew it fast. This will leave plenty of looseness for bagging of the cover.

## BOX KITE

In a wind that is too strong for other kites a box kite will fly safely. These kites are hard pullers and should be fastened to a good strong kite line.

It is also a good plan to have a reel to wind the kite line on, also a pair of gloves to keep the line from burning the hands when letting it out.

It is great fun to send a paper parachute up the kite line on a bent pin. When it is a short distance from the kite it can be released by a quick jerk on the line. Sometimes it will sail for miles in a good breeze if it is released from a great height.

A good parachute can be made from a tissue paper napkin with a thread twelve inches long tied to each corner and weighted on the end with a shingle nail. Put a bent pin in the center of the napkin and place it on the kite line.

The breeze will carry it up the line towards the kite. It can be released at any time by a quick jerk at the kite line.

### Material Needed

Lumber—Spruce, yellow pine, white pine or basswood.

| Pieces | Finished Sizes—In.                   | Use          |
|--------|--------------------------------------|--------------|
| 4      | $\frac{1}{4}$ "x $\frac{1}{2}$ "x36" | Uprights     |
| 4      | $\frac{1}{4}$ "x $\frac{1}{2}$ "x21" | Cross pieces |

### Hardware, Etc.

One-half inch brads.

Strong twine.

Two pieces of cambric lining eleven inches wide, sixty-five inches long.

### Construction

1. First make the four upright sticks and be very careful that they are

7. On the back of the kite tie a strong piece of string to one end of the cross piece. Pull this string tightly until the cross piece is bowed out about three inches in the center and tie it fast to the other end. Place the small brace between this string and the cross piece for support. (See drawing.)

8. The bridle is now attached to the bottom of the upright and just above the cross piece. The bridle must be long enough to reach the outside end of the cross piece. This is the best point to fasten the kite line onto the bridle. If the kite does not fly successfully the first time, adjust the bridle or bow the cross piece a little more. It may take a few trial flights to get all the adjustments correct. Be sure to follow the drawing carefully. With the right materials and a little patience you will be successful.

all the same thickness, width and length. Make sticks exact size as given.

2. Next make the cross pieces and follow the same method as used in making the uprights. These cross sticks must have a notch one-fourth inch by one-fourth inch cut in the center of each end for the upright pieces to fit in. (See detail.)

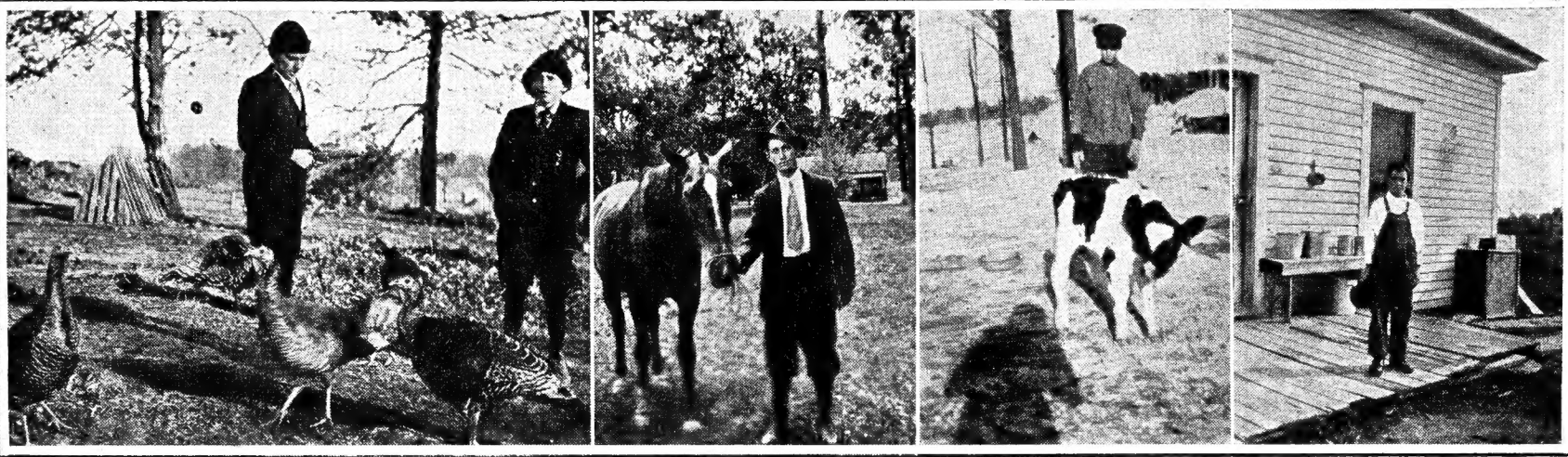
3. Find the exact center of these cross pieces and put them together with a couple of half inch brads and lash the joint with string as shown.

4. Cut a notch in each end of the four upright pieces for the top and bottom string. (See detail.) Put upright pieces in the notches on ends of cross braces and tie a string around the top and bottom edge of the uprights. The cross braces are set inside the frame four inches from the ends of the uprights.

5. Measure the distance around the frame, and cut the cloth one inch longer to allow for the seam when sewing the two ends together. The cloth is cut eleven inches wide to allow for a half inch hem on each edge. Make these two cloth bands small enough so the cross braces will fit tightly between the uprights. This will allow the bands to be stretched around the frame, which is one of the important things about making a good box kite. It is a good idea to glue these bands to the edges of the four upright pieces.

6. The bridle is attached to the top end of one of the upright pieces. This makes the kite fly diagonally in the air. If you attach the bridle to two of the uprights the kite will fly horizontally.

This kite does not need a tail and if carefully made it is a sure flier. Before you put this kite up on a windy day be sure and test the kite line, as this kite is a strong puller, and may be lost or broken if the kite line gives way while it is in the air.



A loan helped Lowell Morgan

Amon Allen, Alabama

Hugh Dexter, Minnesota

Jas. W. Porter, Missouri

## *Ownership for Young Farm People*

To help develop ownership among farm boys and girls, Successful Farming conducts a Boys' and Girls' Bureau which works in cooperation with the established club organizations of the states and nation.

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Over \$100,000.00 has been loaned thus far to 5,000 boys and girls. They have produced food and feed amounting in value to several times this amount, and have acquired valuable business training. They now have a real interest in farm life, and will make the farm their home. The pictures above show a few boys who have been helped thru this loan service.

A copy of the plan will be mailed on request.

SUCCESSFUL FARMING, Des Moines, Iowa



# FARM BOYS' AND GIRLS' LEADER



Farm Boys' and Girls' Leader and Club Achievements was started with the first issue in January, 1919. The chief purpose of the publication is to promote the Boys' and Girls' Club movement over the United States. It supplies a publication for the boys and girls of the farm, reports the activities of clubs and club members

in all sections of the country, reports unusual achievements of boys and girls here and there, keeps the farm children in touch with the county, state and national club leaders, and promotes the general welfare of the boys and girls of the farms.

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